AMENDMENT TO THE CLAIMS

1-16. (Canceled)

17. (Currently amended) A method for manufacturing a semiconductor, comprising:

a growing process for growing a p-type nitride semiconductor layer over a substrate in an atmosphere containing at least a p-type dopant and hydrogen; and

a cooling process for cooling the substrate in an atmosphere containing at least hydrogen greater than 0% and less than or equal to 50% in capacity percent, said cooling process being performed with a combination of hydrogen concentration in the atmosphere and cooling time such that the resulting p-type nitride semiconductor layer has a hole carrier concentration of approximately $1 \times 10^{16} cm^{-3}$ or higher at room temperature ~~wherein the temperature of the substrate is reduced to approximately 600°C within 30 minutes~~.

18. (Previously presented) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 25 minutes.

19. (Previously presented) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 20 minutes.

20. (Previously presented) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 15 minutes.

21. (Previously presented) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 10 minutes.

22. (Previously presented) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 5 minutes.

23. (Previously presented) The method according to claim 17, wherein the hole carrier concentration of said p-type nitride semiconductor layer decreases during said cooling process.

24. (Previously presented) The method according to claim 23, wherein the decrease of said hole carrier concentration is 0% - 95%.

25. (Previously presented) The method according to claim 17, wherein the atmosphere in said growing process contains hydrogen for 5% - 70% in capacity percent.

26. (Previously presented) The method according to claim 17, wherein during said cooling process, the substrate is in an atmosphere containing ammonia.

27. (Previously presented) A method for manufacturing a semiconductor, comprising:

a growing process for growing a p-type nitride semiconductor layer over a substrate in an atmosphere containing at least a p-type dopant and hydrogen; and

a cooling process for cooling the substrate from approximately 950°C to approximately 700°C in an atmosphere containing at least hydrogen, said cooling process being performed with a combination of hydrogen concentration in the atmosphere and cooling time such that the

resulting p-type nitride semiconductor layer has a hole carrier concentration of approximately 1 x $10^{16}cm^{-3}$ or higher at room temperature.

28. (Previously presented) The method according to claim 27, wherein

the combination of said hydrogen concentration in atmosphere and said cooling time falls within a region specified by points A - B - C - D - E - F, in an X - Y coordinate, X axis representing said hydrogen concentration (%) in atmosphere, Y axis representing said cooling time (min.); where, the point A(50, 1.0), point B(30, 1.8), point C(10, 4.1), point D(0, 15), point E(0, 0.5) and point F(50, 0.5).

29. (Previously presented) A method for manufacturing a semiconductor, comprising:

a growing process for growing a p-type nitride semiconductor layer over a substrate in an atmosphere containing at least a p-type dopant and hydrogen; and

a cooling process for cooling the substrate in an atmosphere containing at least hydrogen, said cooling process being performed at the vicinity of approximately 800°C with a combination of hydrogen concentration in the atmosphere and cooling rate such that the resulting p-type nitride semiconductor layer has a hole carrier concentration of approximately 1 x $10^{16}cm^{-3}$ or higher at room temperature.

30. (Previously presented) The method according to claim 29, wherein

the combination of said hydrogen concentration in atmosphere and said cooling rate falls within a region specified by points O - P - Q - R - S - T, in an X - Y coordinate, X axis

representing said hydrogen concentration (%) in atmosphere, Y axis representing said cooling rate (°C/ min.); where, the point O(50, 250), point P(30, 140), point Q(10, 61), point R(0, 17), point S(0, 500) and point T(50, 500).

31. (Currently amended) The method according to claim 17, wherein the temperature of the substrate is reduced to approximately 600°C within 30 minutes ~~wherein the hole carrier concentration is approximately 1 x 10^{16}cm^{-3} or higher at room temperature~~.

32. (Previously presented) The method for manufacturing a semiconductor 17, wherein the cooling time for cooling the substrate from 950°C to approximately 600°C is controlled so that the hole carrier concentration is approximately 1 x 10^{16}cm^{-3} or higher at room temperature.

33-34. (Canceled)